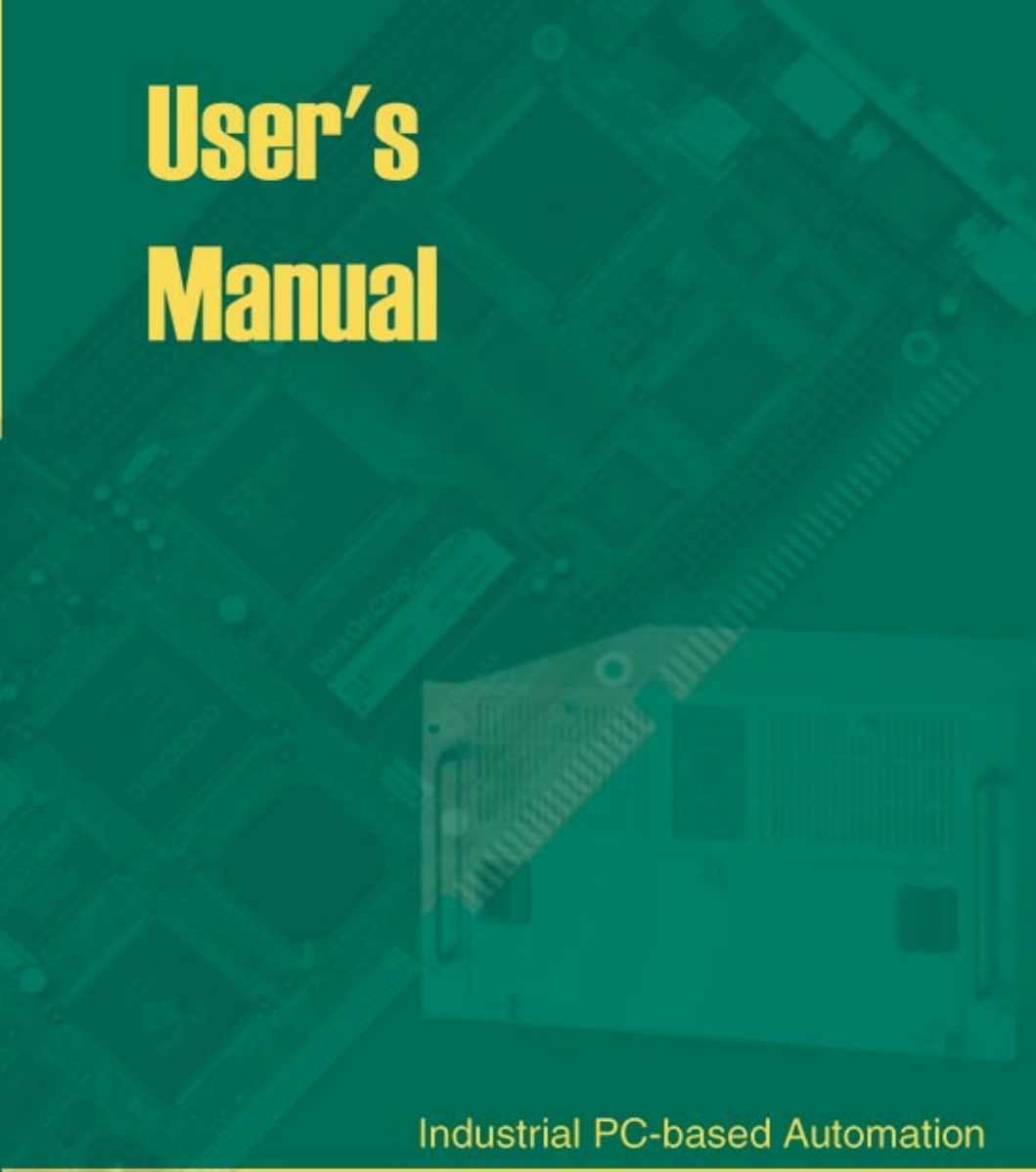
User's Manual



Industrial PC-based Automation

HiCORE-i6320

Full-size PICMG Socket 370 Pentium III / Celeron PC-133 CPU Card with High Drive ISA, 4xAGP SVGA, Fast Ethernet, SCSIand DiskOnChipSocket

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Introduction

The SBC is based on Intel 815E chipset that combines PC-133, 133MHz FSB, UltraDMA/100 IDE technologies and rich 4xAGP 2D/3D graphics capabilities in a single package. Its onboard 10Base-T/100Base-TX Fast Ethernet, CRT display controller, and Flat TMDS Panel Link LCD with DVI Interfaces add communication and multimedia features to its powerfull function.

A wide range of CPUs including Intel® Pentium® III/ Tualatin / Celeron™ and VIA Cyrix® III processors are supported up to 1.26GHz at 133MHz FSB, while memory is expandable to 512MB PC-133 SDRAM.

The Intel 815E chipset consists of the 82815 GMCH Northbridge and 82801BA ICH2 Super Southbridge. It integrates Intel 815/ Sil 164 DVI supported with 4xAGP data transfer by using Dynamic Video Memory Technology.

The highlight of the Super Southbridge supports high speed PCI UltraDMA/100 enhanced IDE which can tremendously increases transfer speed for database applications. Other exclusive features include onboard DiskOnChip®+ 2000 socket for memory up to 288MB.

Specifications

General Specifications

- **CPU** : Socket 370 FC-PGA2/FC-PGA Pentium®III, Tualatin, Celeron™, VIA C3™ with 133/100/66MHz FSB
- **Chipset** : Intel 815E (82815 GMCH Northbridge and 82801BA ICH2 Southbridge) integrates Graphics Memory Controller Hub with Dynamic Viedo Memory Technology and supports PC-133 memory bus, 133MHz FSB and UltraATA/100 IDE interfaces
- **BIOS** : AWARD® Flash BIOS Green&Soft Off function version 6.0, LS120, multiple boot function, FWH 4MB
- **Green Function** : power saving supported in BIOS. DOZE /STANDBY / SUSPEND modes, ACPI & APM
- **L2 Cache** : Integrated on CPU
- **DRAM Memory** : up to 512MB of SDRAM in two168-pin DIMM sockets (supports PC-133 SDRAM)
- **Enhanced IDE with UltraDMA** : supports 2 ports and up to 4 ATAPI devices. UltraDMA transfer 33/66 and 100 MB/sec
- **Watchdog Timer** : 127-level timer generates RESET or NMI when your application loses control over the system.
- **Real-time Clock** : built-in chipset with lithium battery backup for 10 years of data retention. CMOS data backup of BIOS setup and BIOS default.

High Speed Multi I/O

- **Chipset** : Winbond W83627HF
- **Serial Ports** : one external high speed RS-232C port COM1 (DB9 on bracket), one internal high speed RS-232C/422/485 port COM2 (jumper selectable, 10-pin box header). Both with 16C550 compatible UART and 16 byte FIFO.
- **USB** : 4 onboard USB ver 1.1 ports (Dual 2x 5-pin header)
- **SIR Interface** : onboard IrDA TX/RX port (5-pin header)
- **Floppy Disk Drive Interface** : 2 floppy disk drives, 5¼" (360 KB or 1.2 MB) and 3½" (720 KB, 1.44 MB or 2.88 MB).
- **Bi-directional Parallel Port** : SPP, EPP and ECP mode.
- **Keyboard and Mouse Connectors** : external PS/2 KB/Mouse port (2-in-1 mini DIN) onboard AT Keyboard port (5-pin box header)

Network Interface Controller

- **Chipset** : Intel 82559, 10/100 Mbps, autoswitching
- **Connector** : external RJ-45 with LEDs on bracket

Display Controller

- **Chipset** : 4x AGP Intel 82815 2D/3D engines integrated in Intel 815E Supports 4MB on board SDRAM
- **Display Type** : CRT (VGA, SVGA, XGA, SXGA) and LCD (optional, see LCD Daughterboard) Type
- **Connectors** : external DB15 for CRT on bracket and DVI Connector for TMDS daughterboard
- **LCD Display Daughterboard (optional)** : TMDS Panel Link with DVI interface

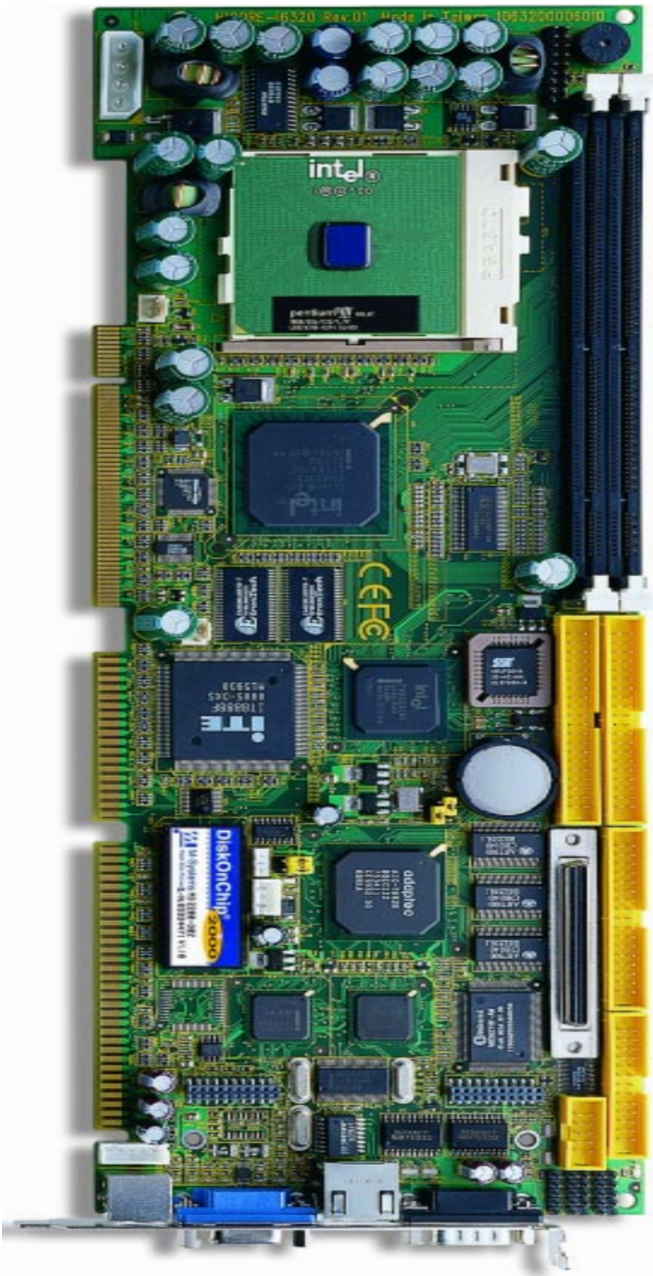
Flash Disk DiskOnChip®2000

- **Package** : Single Chip Flash Disk in 32-pin DIP JEDEC
- **Capacity** : up to 288 MByte
- **Data Reliability** : ECC/EDC error correction
- **Memory Window** : 8 KByte

Environmental and Power

- **Power Requirements** : +5 V @ 6.8 A (typical), ±12 V @ 0.08A (typical) ; (FC-PGA Pentium® III 1.0 GHz at 133 FSB and 512 MB PC-133 SDRAM)
- **CPU Power** : onboard PWM switching power supply for autodetects CPU core voltage
- **System Monitoring and Alarm** : CPU and System temperature, system voltage and cooling fan RPM.
- **Board Dimensions** : 338 mm x 122 mm
- **Board Weight :** 0.6 Kg.
- **Operating Temperature** : 0 to 60°C (32 to 140°F)

Board Image



Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system

Ordering Codes

HiCORE-i6320VL3S Full-size PICMG-bus Socket 370 Tualatin, Pentium-III / Celeron PC-133 CPU Card with High Drive ISA, LCD/ CRT SVGA, Triple Ethernet and SCSI Interface (includes FEMD-LD1301 daughterboard)

HiCORE-i6320VL3 Full-size PICMG-bus Socket 370 Tualatin, Pentium-III / Celeron PC-133 CPU Card with High Drive ISA, LCD/ CRT SVGA, Triple Ethernet (includes FEMD-LD1301 daughterboard)

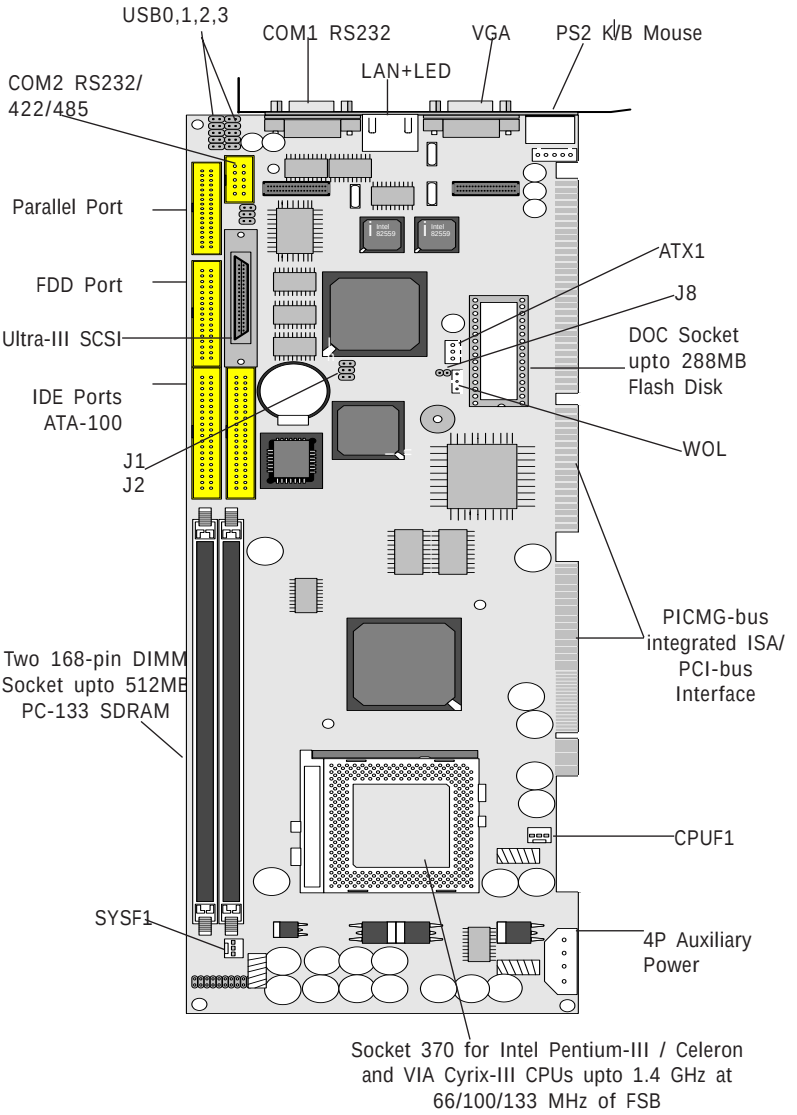
HiCORE-i6320VL/D Full-size PICMG-bus Socket 370 Tualatin, Pentium-III / Celeron PC-133 CPU Card with High Drive ISA, LCD/CDT SVGA (includes FEMD-D1301A daughterboard)

HiCORE-i6320VL Full-size PICMG-bus Socket 370 Tualatin, Pentium-III / Celeron PC-133 CPU Card with High Drive ISA, CRT SVGA

FEMD-LD1301 : Daughterboard with Dual Fast Ethernet, one DVI port and PS/2 mouse port

FEMD-D1301A : Daughterboard with one Flat Panel DVI port on bracket

Board Layout Front



Jumper/Connector Quick Reference

Jumpers

Lable	Function
J1	Clear CMOS
J2	Watchdog Output
J4	RS-232,422/485 select
J8	H/W Monitor Alarm

Jumper/Connector Quick Reference

Connectors	
Lable	Function
ATX1	ATX Feature Connectorr
COM1	Serial Port: COM1
COM2	Serial Port: COM2
CPUF1	CPU FAN1 Connector
DBC1	Daughter board Connector1
DBC2	Daughter board Connector2
DIMM1	SDRAM bank 1/2 168 pin DIMM
DIMM2	SDRAM bank 3/4 168 pin DIMM
DVI	Digital Visual Interface Connector
EKB	External Keyboard Connector
ESMI	External SMI
ESPK	External Speaker
FDD	Floppy Disk Driver Connector
HLED	HDD LED Connector
IDE1	Primary IDE Connector
IDE2	Secondary IDE Connector
KBM	PS/2 Keyboard & Mouse
LAN1	10/100M LAN1 Connector
LAN2	10/100M LAN2 Connector
LAN3	10/100M LAN3 Connector
LPT	Parallel Port
PLKL	Power LED & Keyboard Lock
PSM	PS/2 Mouse
PSON	ATX Soft Power Switch
PWR	4P Auxiliary Power Connector
SCSI	Ultra-III LVD/SE SCSI 68 pin Connector

Jumper/Connector Quick Reference

Connectors

Lable	Function
SIR	Infrared (IR) Connector
SYSF	Chassis Auxiliary Fan Connector
RES	Reset Connector
USB1	USB Port 0,1
USB2	USB Port 2,3
VGA	CRT SVGA Connector
WOL	Wake On LAN

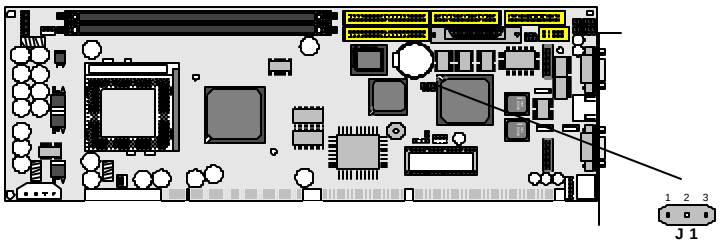
CMOS Jumper Settings

CMOS Setup (J1)

Type : J1: onboard 3-pin header

CMOS Setup (J1)	J1	
Keep CMOS	1-2	ON
Clear CMOS	2-3	OFF

default setting: 1-2



Watchdog Timer

Watchdog Output (J2)

The onboard watchdog timer can be disable by jumper setting or enable for either reboot by system RESET or invoking an NMI (Non-Maskable Interrupt)

Even if enabled by jumper setting upon boot the watchdog timer is always inactive. To initialize or refresh the watchdog timer writing of port F2 is sufficient. To disable the watchdog time read port 44h.

Status	Action
Enable/refresh the Watchdog Timer	I/O Write F2
Disable the Watchdog Timer.	I/O Read 044H

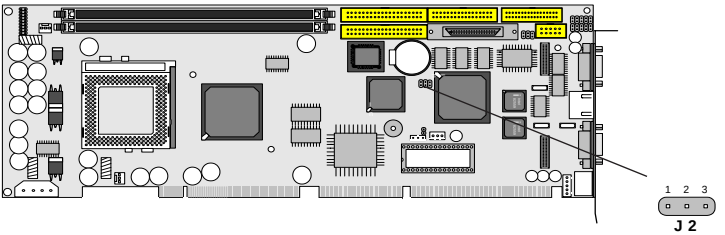
After the watchdog timer has been initialized by writing port F2, it has to be strobed at preconfigured intervals to keep it from issuing a RESET or NMI.

The watchdog timer timeout intervals are set by software programming.

Mode Setting

Watchdog Mode	J2
Enabled for Active NMI(I/O Channel Check)	1-2
Enabled for System Reset	2-3
Disable Watchdog Timer	None

default setting



Timeout Values

Timout values are programmed. The watchdog timer supports 127 steps. use the table on the next page to find the hexidecimal value that needs to be passed on to get the correct timer interval. Look subsequntly at the program

example how to pass the value to the watchdog timer.

Timeout Table

Level	Value	Seconds	Level	Value	Seconds	Level	Value	Seconds
1	7Fh	1	2	7Eh	2	3	7Dh	3
4	7Ch	4	5	7Bh	5	6	7Ah	6
7	79h	7	8	78h	8	9	77h	9
10	76h	10	11	75h	11	12	74h	12
13	73h	13	14	72h	14	15	71h	15
16	70h	16	17	6Fh	17	18	6Eh	18
19	6Dh	19	20	6Ch	20	21	6Bh	21
22	6Ah	22	23	69h	23	24	68h	24
25	67h	25	26	66h	26	27	65h	27
28	64h	28	29	63h	29	30	62h	30
31	61h	31	32	60h	32	33	5Fh	33
34	5Eh	34	35	5Dh	35	36	5Ch	36
37	5Bh	37	38	5Ah	38	39	59h	39
40	58h	40	41	57h	41	42	56h	42
43	55h	43	44	54h	44	45	53h	45
46	52h	46	47	51h	47	48	50h	48
49	4Fh	49	50	4Eh	50	51	4Dh	51
52	4Ch	52	53	4Bh	53	54	4Ah	54
55	49h	55	56	48h	56	57	47h	57
58	46h	58	59	45h	59	60	44h	60
61	43h	61	62	42h	62	63	41h	63
64	40h	64	65	3Fh	65	66	3Eh	66
67	3Dh	67	68	3Ch	68	69	3Bh	69
70	3Ah	70	71	39h	71	72	38h	72
73	37h	73	74	36h	74	75	35h	75
76	34h	76	77	33h	77	78	32h	78
79	31h	79	80	30h	80	81	2Fh	81
82	2Eh	82	83	2Dh	83	84	2Ch	84
85	2Bh	85	86	2Ah	86	87	29h	87
88	28h	88	89	27h	89	90	26h	90
91	25h	91	92	24h	92	93	23h	93
94	22h	94	95	21h	95	96	20h	96
97	1Fh	97	98	1Eh	98	99	1Dh	99
100	1Ch	100	101	1Bh	101	102	1Ah	102
103	19h	103	104	18h	104	105	17h	105
106	16h	106	107	15h	107	108	14h	108
109	13h	109	110	12h	110	111	11h	111
112	10h	112	113	0Fh	113	114	0Eh	114
115	0Dh	115	116	0Ch	116	117	0Bh	117
118	0Ah	118	119	09h	119	120	08h	120
121	07h	121	122	06h	122	123	05h	123

124	04h	124	125	03h	125	126	02h	126
127	01h	127						

Programming Example

The following program is an examples of how to enable, disable and refresh the Watchdog timer:

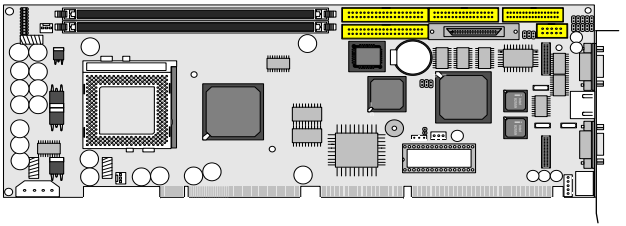
```
WDT_EN_RF       equ     F2

WDT_DIS equ     044h

WT_Enable       push AX         ; Save AX,DX
                push DX
                mov DX,WDT_EN_RF        ; Enable Timer
                mov AX,INTERVAL ; Set Timeout Value
                out DX,AX
                pop DX                  ; Restore DX,AX
                pop AX
                ret

WT_Refresh      push AX         ; Save AX,DX
                push DX
                mov DX,WDT_EN_RF        ; Refresh Timer
                mov AX,INTERVAL ; Set Timout Value
                out DX,AX
                pop DX                  ; Restore DX,AX
                pop AX
                ret

WT_Disable      push AX         ; Save AX,DX
                push DX
                mov DX,WDT_DIS  ; Disable Timer
                in AX,DX
                pop DX                  ; Restore DX,AX
                pop AX
                ret

WT_Disable      push AX         ; save AX,DX
                push DX
                mov DX,WDT_DIS  ; Disable Timer
                in AX,DX
                pop DX                  ; restore DX,AX
                pop AX
                ret
```

Serial Port Selection (RS232C/422/485)

RS-232/422/485 Mode select (J4)

RS-422/485 Mode on COM2

The onboard COM2 port can be configured to operate in RS-422 or RS-485 modes. RS-422 modes differ in the way RX/TX is being handled. Jumper J4 switches between RS-232 or RS-422/485 mode. When J4 is set to RS-422 or 485 mode, there will be only +12V output left while J4 is set. All of the RS-232/422/485 modes are available on COM2.



COM2

Pin Defined:	RS232	RS422	RS485
Pin1 :	DCD	Tx-	RTx-
Pin2 :	RXD	Tx+	RTx+
Pin3 :	TxD	Rx+	x
Pin4 :	DTR	Rx-	x

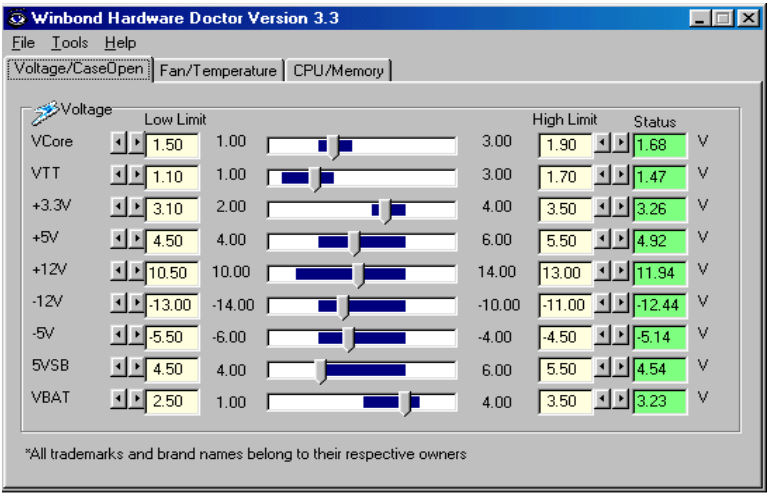
J4 Selection	**1-2**	**3-4**	**5-6**
RS-232	Close	Open	Open
RS-422	Open	Close	Open
RS-485	Open	Open	Close

default setting

Hardware monitor Alarm

Hardware monitor Alarm: J8

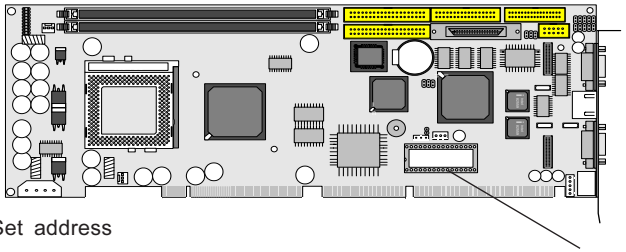
Hardware monitor alarm can be selected enable or disable by jumper (J8). There are three main functins for this item: Voltage/CaseOpen, Fan/Temperature and CPU/Memory.


Winbond Hardware Doctor Version 3.3
File Tools Help
Voltage/CaseOpen
Fan/Temperature
CPU/Memory
Voltage
Low Limit
High Limit
Status
VCore 1.50 1.00 3.00 1.90 1.68 V
VTT 1.10 1.00 3.00 1.70 1.47 V
+3.3V 3.10 2.00 4.00 3.50 3.26 V
+5V 4.50 4.00 6.00 5.50 4.92 V
+12V 10.50 10.00 14.00 13.00 11.94 V
-12V -13.00 -14.00 -10.00 -11.00 -12.44 V
-5V -5.50 -6.00 -4.00 -4.50 -5.14 V
5VSB 4.50 4.00 6.00 5.50 4.54 V
VBAT 2.50 1.00 4.00 3.50 3.23 V
*All trademarks and brand names belong to their respective owners

DiskOnChip Base Address

Installation Instructions

1. Make sure the Single Board Computer is powered OFF.
2. Plug the DOC (DiskOnChip®2000) device into its socket. Verify the direction is correct (pin 1 of the DiskOnChip®2000 is aligned with pin 1 of the socket)



3. Set address

Base Address	BIOS Selected
D8000h	OFF
D0000h	ON

default setting

4. Power up the system
5. During power up you may observe a message displayed by the DOC when its drivers are automatically loaded into system's memory
6. At this stage the DOC can be accessed as any disk in the system
7. If the DOC is the only disk in the system, it will appear as the first disk (drive C: in DOS)
8. If there are more disks besides the DOC, the DOC will appear by default as the last drive, unless it was programmed as first drive. (please refer to the DOC utilities user manual)
9. If you want the DOC to be bootable:
   a - copy the operating system files into the DOC by using the standard DOS command (for example: sys d:)
   b - The DOC should be the only disk in the systems or should be configured as the first disk in the system (c:) using the DUPDATE utility

For more information on DiskOnChip®2000, visit M-Systems Web site at

http:// www.m-sys.com

where you can find the utilities manual, data sheets and application notes. In addition, you can find the latest DiskOnChip®2000 S/W utilities.

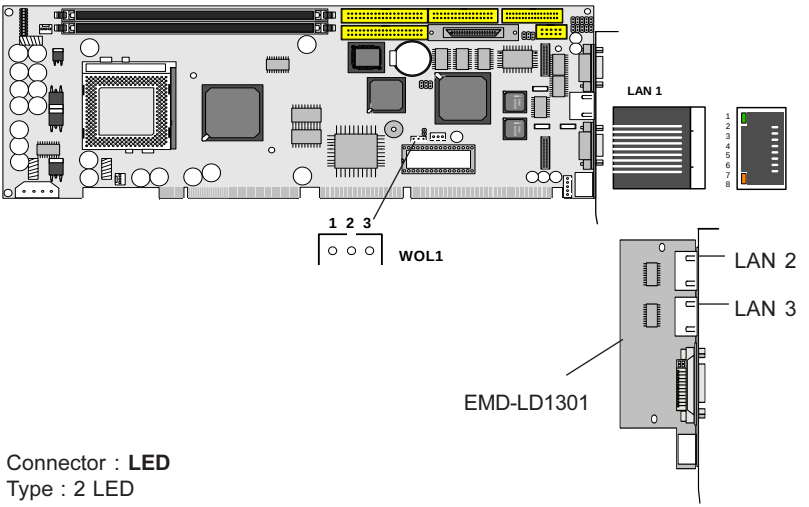
Triple Fast Ethernet Connectors

LAN Port

Connector : **LAN1**
Type : external RJ-45 on bracket

Pin	1	2	3	4	5	6	7	8
Desciption	TX+	TX-	RX+	NC	NC	RX-	NC	NC

LAN LED Indicator on RJ-45 connector



Connector : **LED**
Type : 2 LED

LED	ACT (yellow)	Speed (green)
Desciption	Active Transfer	100 MB mode

Wake On LAN

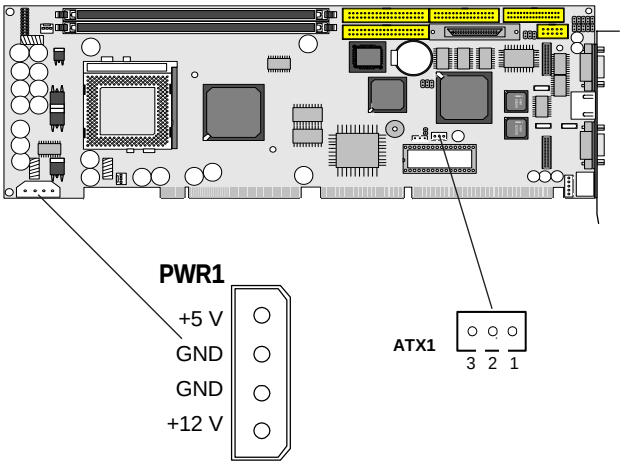
Connector: **WOL1**
Type : onboard 3-pin wafer connector

Pin	Description
1	5V_SB
2	GND
3	WOL_CTL

Power Connector

ATX Feature Connector

ATX Feature Connector:ATX1



Type : onboard 3-pin Wafer connector

Pin	Description
1	5V
2	GND
3	PS-ON

4P Auxiliary Power

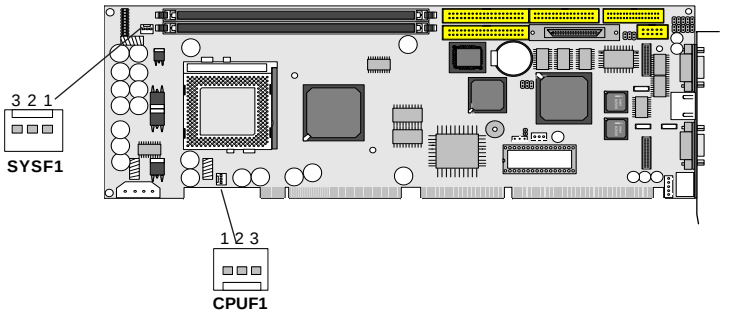
Connector : **PWR**
Type : onboard 4-pin Wafer connector

Pin	Description
1	5V SB(Standby)
2	GND
3	GND
4	12V

CPU Fan Connector

Connector : **CPUF1**
Type : onboard 3-pin wafer connector

Pin	Description
1	GND
2	+12V
3	FAN_CTL

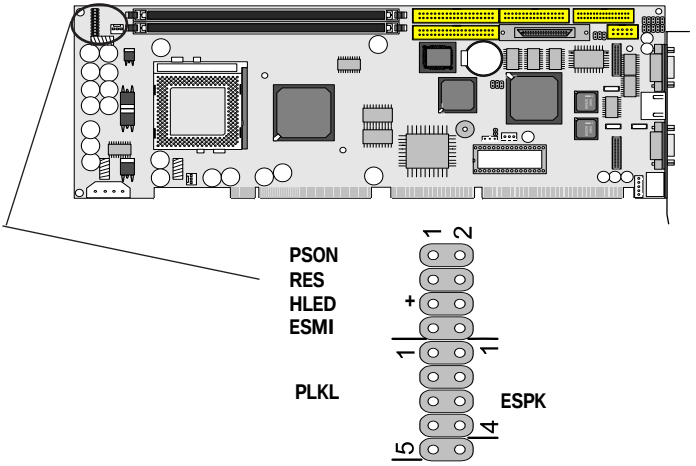


Chassis Auxilary Fan Connector

Connector : **SYSF1**
Type : onboard 3-pin header

Pin	Description
1	GND
2	+12V
3	FAN_CTL

Switches and Indicators



Power LED and Keyboard Lock Connector

Connector : **PLKL**
Power LED can be indicated when the CPU card is on or off. And keyboard lock can be used to disable the keyboard function so the PC will not respond by any input.

Pin	Description
1	LED power (+5V)
2	NC
3	GND
4	Keyboard Lock
5	GND

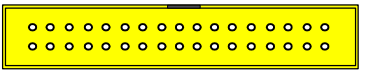
External Speaker Connector

Connector : **ESPK**

Pin	Description
1	+5V
2	GND
3	Internal buzzer
4	Speak out

Interface Connectors HDD, FDD

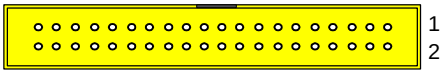
Floppy Disk Drive Connector



Connector : **FDD**
Type : onboard 34-pin box header

Pin	Description	Pin	Description
1	GND	2	DRIVE DENSITY SELECT 0
3	GND	4	DRIVE DENSITY SELECT 1
5	GND	6	NC
7	GND	8	#INDEX
9	GND	10	#MOTOR ENABLE A
11	GND	12	#DRIVER SELECT B
13	GND	14	#DRIVER SELECT A
15	GND	16	#MOTOR ENABLE B
17	GND	18	#DIRECTION
19	GND	20	#STEP
21	GND	22	#WRITE DATA
23	GND	24	#WRITE GATE
25	GND	26	#TRACK 0
27	GND	28	#WRITE PROTECT
29	GND	30	#READ DATA
31	GND	32	#HEAD SELECT
33	GND	34	#DISK CHANGE

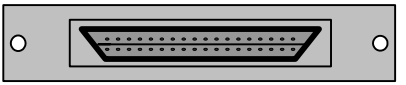
Enhanced IDE Connector



Connector : **IDE1 and IDE2**
Type : Two onboard 40-pin box headers, primary and secondary IDE

Pin	Description	Pin	Description
1	#RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC/(Vcc)
21	REQ	22	GND
23	#IOW	24	GND
25	#IOR	26	GND
27	#IORDY	28	IDESEL
29	#DACK	30	GND
31	IRQ	32	NC
33	ADDR1	34	CBLID
35	ADDR0	36	ADDR2
37	#CS0	38	#CS1(#HD SELET1)
39	#ACT	40	GND

SCSI Interface Connector



Connector : **SCSI**

Type : onboard 68-pin box header

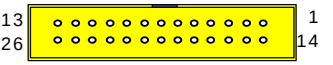
Pin	Description	Pin	Description
1	SD+12	2	SD+13
3	SD+14	4	SD+15
5	SDP+1	6	SD+0
7	SD+1	8	SD+2
9	SD+3	10	SD+4
11	SD+5	12	SD+6
13	SD+7	14	SDP+0
15	GND	16	DIFS
17	TPWEX	18	TPWEX
19	NC	20	GND
21	SATN+	22	GND
23	SBSY+	24	SACK+
25	SRST+	26	SMSG+
27	SSEL+	28	SCD+
29	SREQ+	30	SIO+
31	SD+8	32	SD+9
33	SD+10	34	SD+11
35	SD-12	36	SD-13
37	SD-14	38	SD-15
39	SDP-1	40	SD-0

Pin	Description	Pin	Description
41	SD-1	42	SD-2
43	SD-3	44	SD-4
45	SD-5	46	SD-6
47	SD-7	48	SDP-0
49	GND	50	SENIN
51	TPWEX	52	TPWEX
53	NC	54	GND
55	SATN-	56	GND
57	SBSY-	58	SACK-
59	SRST-	60	SMSG-
61	SSEL-	62	SCD-
63	SREQ-	64	SIO-
65	SD-8	66	SD-9
67	SD-10	68	SD-11

Peripheral Port

Parallel Port

Connector : **LPT**
Type : onboard 26-pin box header

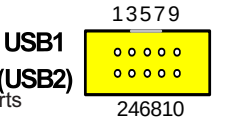


LPT1

Pin	Description	Pin	Description
1	#STROBE	14	#AUTO FEED
2	DATA0	15	#ERROR
3	DATA1	16	#INITIALIZE
4	DATA2	17	#SELECT INPUT
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	#ACKNOWLEDGE	23	GND
11	BUSY	24	GND
12	PAPER EMPTY	25	GND
13	SELECT	26	GND

USB Ports

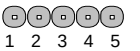
Connector: **USB1, USB2**
Type:onboard Two 10-pin box headers for four USB ports



Pin	Description	Pin	Description
1	VCC	2	VCC
3	DATA-	4	DATA-
5	DATA+	6	DATA+
7	GND	8	GND
9	GND	10	N/C

SIR

Connector : **SIR**
Type : onboard 5-pin header

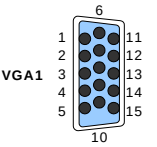


SIR

Pin	Description	Pin	Description
1	Vcc	2	NC
3	IRRX	4	GND
5	IRTX		

CRT SVGA

Connector : **VGA1**
Type : external 15-pin D-sub female connector on bracket



	Pin	Description	Pin	Description	Pin	Description
	1	RED	6	GND	11	NC
	2	GREEN	7	GND	12	VDDAT
	3	BLUE	8	GND	13	HSYNC
	4	NC	9	Vcc	14	VSYNC
	5	GND	10	GND	15	VDCLK

AT Keyboard

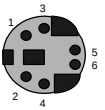
Connector : **EKB**
Type : Onboard 5-pin header

Pin	Description	Pin	Description
1	CLK	2	DATA
3	NC	4	GND
5	Vcc		

Note: ATKB1doesn't provide Vcc power pin on pin-5, that is, ATKB1 cannot connect to AT keyboard directly. ATBK1 supports AT keyboard with passive backplane.

PS/2 Keyboard & Mouse

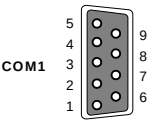
Connector: **KMB**
Type: external 6-pin Mini DIN connector on bracket



	Pin	Description	Pin	Description
	1	KB-DATA	2	MS-DATA
	3	GND	4	VCC
	5	KB-CLK	6	MS-CLK

Note: KB1 supports PS/2 keyboard directly, and PS/2 mouse suppoted with the additional PS2 1-to-2 cable in the standard packing.

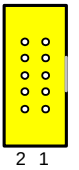
COM1 RS-232C Ports on bracket



Connector : COM1
Type : external 9-pin D-sub male connector on bracket

Pin	Description	Pin	Description
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

COM2 with RS-232/422/485 Mode



Connector : **COM2**
Type : onboard 10-pin box header

Pin	Description	Pin	Description
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

COM2 with RS-422/485 Mode

Connector : **COM2**
Type : onboard 10-pin box header

RS-422 Mode

Pin	Description	Pin	Description
1	TX-	2	TX+
3	RX+	4	RX-
5	X	6	X
7	X	8	X
9	X	10	X

RS-485 Mode

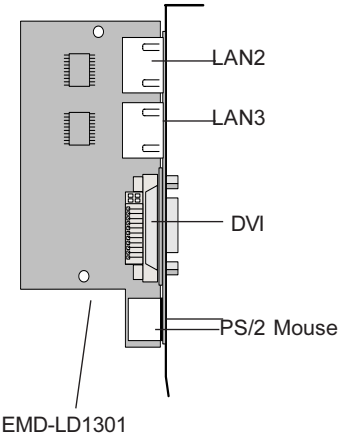
Data- of RS-485 is connected by pin-1

Data+ of RS-485 is connected by pin-2

Convertor Daughter Board

TMDS Panel Liknk with LAN & PS/2 mouse Daughter Board : EMD-LD1301

The daughter board includes with two RJ-45 Ethernet ports, one Flat Panel DVI port and PS/2 mouse port on bracket.



System Resources

Interrupt Assignment

IRQ Address	Description
0	System Timer
1	Keyboard (KB output buffer full)
2	Programmable Interrupt Controller
3	Serial Port 2 (COM2)
4	Serial Port 1 (COM1)
5	Ethernet 2
6	Floppy controller
7	Parallel Port 1
8	Real-Time Clock
9	Software Redirected IRQ2
10	Ethernet 1
11	USB & SCSI device
12	PS/2 Mouse
13	Numeric data processor
14	Primary IDE Controller
15	Secondary IDE Controller

I/O Address Space

Adress	Description
0000 - 000F	DMA Controller
0010 - 001F	Motherboard Resources
0020 - 0021	PIC
0022 - 003F	Motherboard Resources
0040 - 0043	System Timer
0044 - 005F	Motherboard Resources
0060 - 0060	Keyboard
0061 - 0061	Systems Speaker
0062 - 0063	Motherboard Resources
0064 - 0064	Keyboard
0065 - 006F	Motherboard Resources
0070 - 0073	System CMOS / Real time clock
0074 - 007F	Motherboard Resources
02F8 - 02FF	Communications Port B

0080 - 0090	DMA Controller
0094 - 009F	DMA Controller
00A0 - 00A1	PIC
00A2 - 00BF	Motherboard Resources
00E0 - 00BF	Motherboard Resources
00C0 - 00DF	DMA Controller
00F0 - 00FF	Numeric Data Processor
0170 - 0177	Intel Ultra ATA Controller
01F0 - 01F7	Intel Ultra ATA Controller
0376 - 0376	Intel Ultra ATA Controller
0378 - 037F	Printer Port
03F0 - 03F5	Floppy Disk Controller
03F6 - 03F6	Intel Ultra ATA Controller
03F7 - 03F7	Floppy Disk Controller
03F8 - 03FF	C0M1
0400 - 048F	Motherboard Resources
0480 - 048F	Motherboard Resources
04D0 - 04D1	Motherboard Resources
AC00 - AC1F	Motherboard Resources
AC80 - AC9F	Motherboard Resources

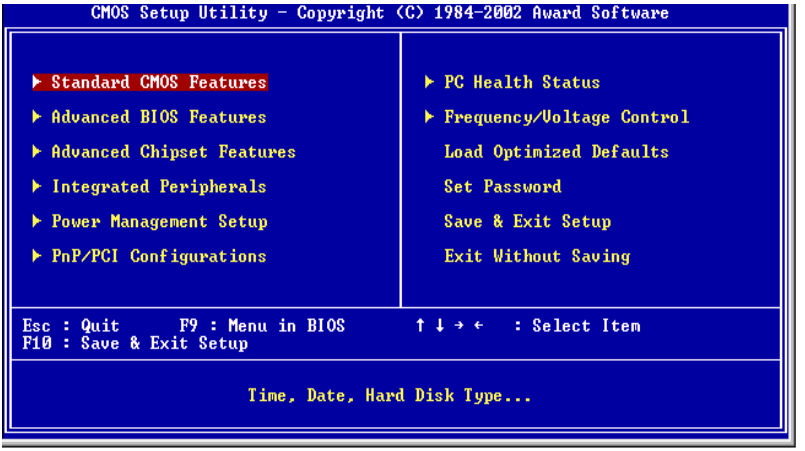
PCI Bus Map

Functino	Device ID	INT#	GNT#
LAN1	AD24	INTE	
LAN2	AD20	INTA	GNTE
LAN3	AD23	INTF	GNTB
SCSI	AD21	INTH	GNTA
Bridge	AD22		GNTF
PCI slot 1	AD31	INTB,C,D,A	GNTA
PCI slot 2	AD30	INTC,D,A,B	GNTB
PCI slot 3	AD29	INTD,A,B,C	GNTC
PCI slot 4	AD28	INTA,B,C,D	GNTD

AWARD BIOS Setup

The SBC uses the Award PCI/ISA BIOS ver 6.0 for the system configuration. The Award BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options which could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

To access AWARD PCI/ISA BIOS Setup program, press <Del> key. The Main Menu will be displayed at this time.



Once you enter the AwardBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Features
Use this menu for basic system configuration.

Advanced BIOS Features
Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Setup
Use this menu to specify your settings for power management.

PnP / PCI Configuration
This entry appears if your system supports PnP / PCI.

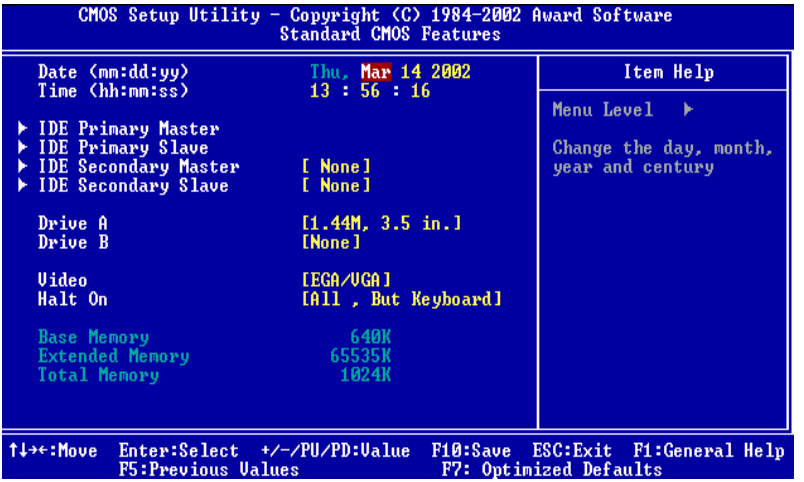
Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

Load Optimized Defaults
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Set Password
Use this menu to set User and Supervisor Passwords.

Save & Exit Setup
Save CMOS value changes to CMOS and exit setup.

Exit Without Save
Abandon all CMOS value changes and exit setup.


CMOS Setup Utility - Copyright (C) 1984-2002 Award Software
Standard CMOS Features
Date (mm:dd:yy) Thu, Mar 14 2002
Time (hh:mm:ss) 13 : 56 : 16
IDE Primary Master
IDE Primary Slave
IDE Secondary Master [None]
IDE Secondary Slave [None]
Drive A [1.44M, 3.5 in.]
Drive B [None]
Video [EGA/VGA]
Halt On [All , But Keyboard]
Base Memory 640K
Extended Memory 65535K
Total Memory 1024K
Item Help
Menu Level ▶
Change the day, month, year and century
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: Optimized Defaults

↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

Date
The BIOS determines the day of the week from the other date information; this field is for information only.

Time
The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the « or (key to move to the desired field . Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

IDE Primary Master/Slave
IDE Secondary Master/Slave
Options are in sub menu (see page 30)

Drive A, B
Select the correct specifications for the diskette drive(s) installed in the computer.

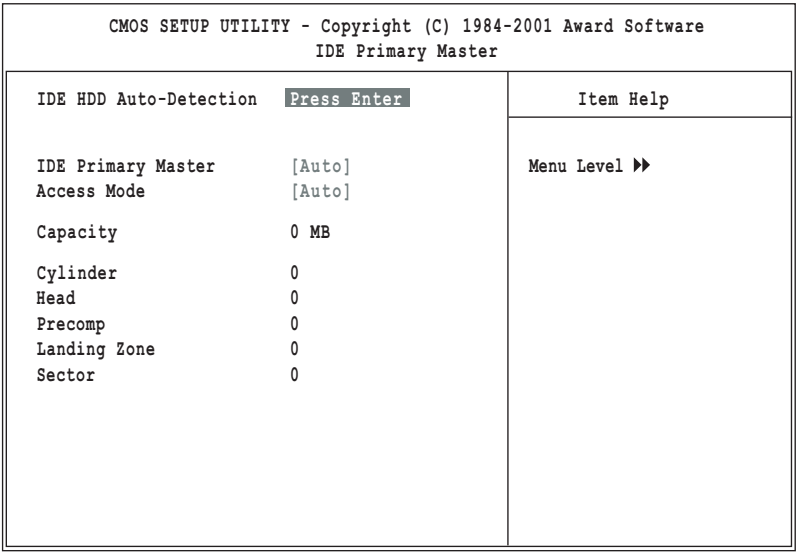
None :	No diskette drive installed
360K ;	5.25 in 5-1/4 inch PC-type standard drive
1.2M ;	5.25 in 5-1/4 inch AT-type high-density drive
720K ;	3.5 in 3-1/2 inch double-sided drive
1.44M ;	3.5 in 3-1/2 inch double-sided drive
2.88M ;	3.5 in 3-1/2 inch double-sided drive

Video Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in Setup.

Halt On During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

No errors	POST does not stop for any errors.
All errors	If the BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.
All, But Keyboard	POST does not stop for a keyboard error, but stops for all other errors.
All, But Diskette	POST does not stop for diskette drive errors, but stops for all other errors.
All, But Disk/Key	POST does not stop for a keyboard or disk error, but stops for all other errors.

IDE Harddisk Setup (submenu)



IDE HDD Auto-detection
Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.

IDE Primary Master
Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !

Capacity
Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.

Access Mode
Normal, LBA, Large or Auto Choose the access mode for this hard disk

The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'

Cylinder Min = 0 Max = 65535
Set the number of cylinders for this hard disk.

Head Min = 0 Max = 255
Set the number of read/write heads

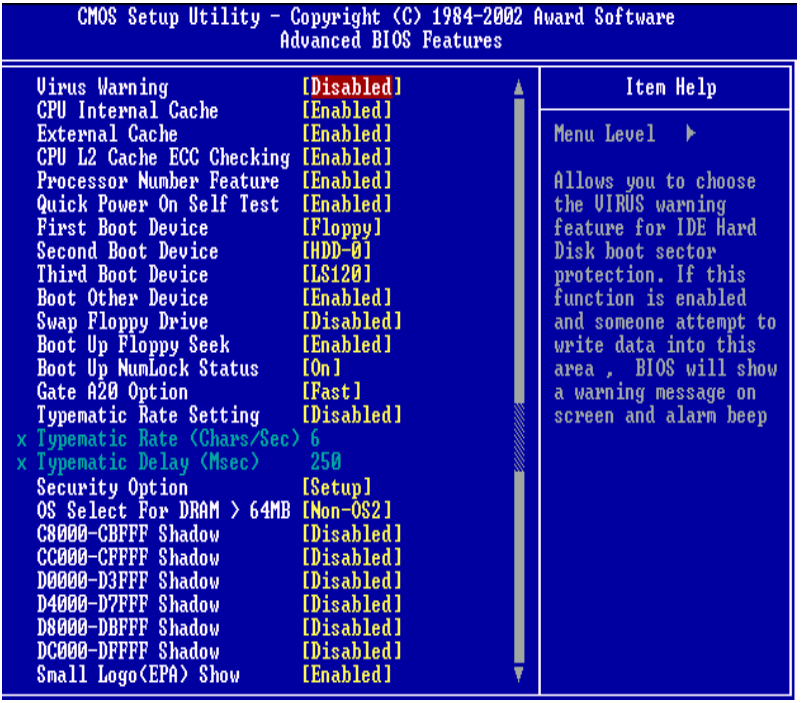
Precomp Min = 0 Max = 65535
**** Warning: Setting a value of 65535 means no hard disk

Landing zone Min = 0 Max = 65535
**** Warning: Setting a value of 65535 means no hard disk

Sector Min = 0 Max = 255
Number of sectors per track

We recommend that you select Type "AUTO" for all drives. The BIOS will auto-detect the hard disk drive and CD-ROM drive at the POST stage.

If your hard disk drive is a SCSI device, please select "None" for your hard drive setting.


CMOS Setup Utility - Copyright (C) 1984-2002 Award Software
Advanced BIOS Features
Virus Warning [Disabled]
CPU Internal Cache [Enabled]
External Cache [Enabled]
CPU L2 Cache ECC Checking [Enabled]
Processor Number Feature [Enabled]
Quick Power On Self Test [Enabled]
First Boot Device [Floppy]
Second Boot Device [HDD-0]
Third Boot Device [LS120]
Boot Other Device [Enabled]
Swap Floppy Drive [Disabled]
Boot Up Floppy Seek [Enabled]
Boot Up NumLock Status [On]
Gate A20 Option [Fast]
Typematic Rate Setting [Disabled]
x Typematic Rate (Chars/Sec) 6
x Typematic Delay (Msec) 250
Security Option [Setup]
OS Select For DRAM > 64MB [Non-OS2]
C8000-CBFFF Shadow [Disabled]
CC000-CFFFF Shadow [Disabled]
D0000-D3FFF Shadow [Disabled]
D4000-D7FFF Shadow [Disabled]
D8000-DBFFF Shadow [Disabled]
DC000-DFFFF Shadow [Disabled]
Small Logo(EPA) Show [Enabled]
Item Help
Menu Level ▶
Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area , BIOS will show a warning message on screen and alarm beep
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

Virus Warning
Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and beep.

Enabled Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Disabled No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU Internal Cache/External Cache
These two categories speed up memory access. However, it depends on CPU/chipset design. Enabled : Enable cache, Disabled : Disable cache

CPU L2 Cache ECC Checking
This item allows you to enable/disable CPU L2 Cache ECC checking.
The choice: Enabled, Disabled.

Processor Number Feature
This feature appears when a a Pentium III processor is installed. It enables you enables you to control whether the Pentium III's serial number can be read by external programs. The choice : Enabled. Disabled

Quick Power On Self Test
This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST. Enabled : Enable quick POST. Disabled : Normal POST

First/Second/Third/Other Boot Device
The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The choices are : Floppy, LS/ZIP, HDD, SCSI, CDROM, Disabled.

Swap Floppy Drive
If the system has two floppy drives, you can swap the logical drive name assignments. The choice: Enabled/Disabled.

Boot Up Floppy Seek
Seeks disk drives during boot up. Disabling speeds boot up.
The choice: Enabled/Disabled.

Boot Up NumLock Status
Select power on state for NumLock. The choice: Enabled/Disabled.

Gate A20 Option
Select if chipset or keyboard controller should control GateA20.
Normal A pin in the keyboard controller controls GateA20
Fast Lets chipset control GateA20

Typematic Rate Setting
Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.
The choice: Enabled/Disabled.

Typematic Rate (Chars/Sec)
Sets the number of times a second to repeat a key stroke when you hold the key down. The choice: 6, 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (Msec)
Sets the delay time after the key is held down before it begins to repeat the keystroke. The choice: 250, 500, 750, 1000.

Security Option
Select whether the password is required every time the system boots or only when you enter setup.

System The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.

Setup The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

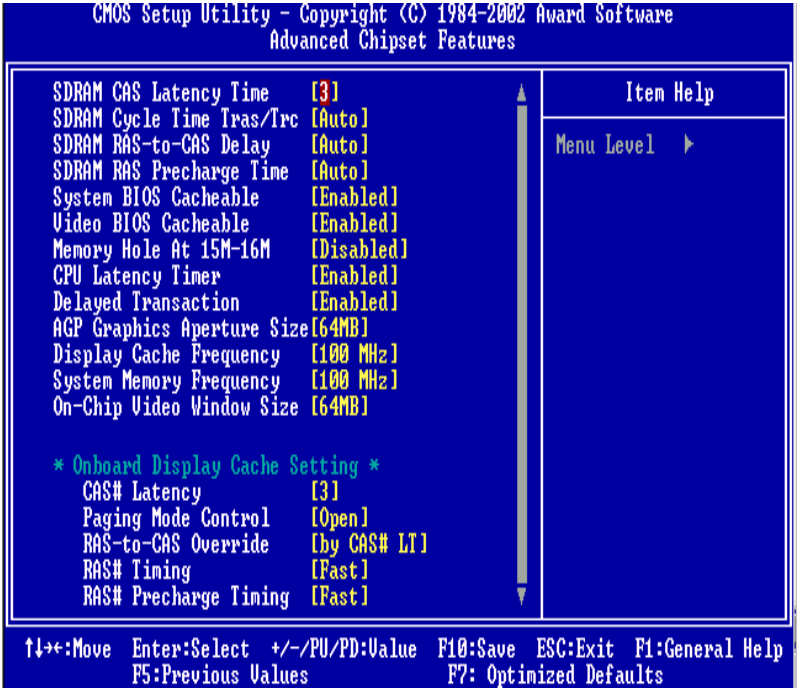
OS Select For DRAM > 64MB
Select the operating system that is running with greater than 64MB of RAM on the system.The choice: Non-OS2, OS2.

Video BIOS Shadow
Enabled this copies the video BIOS from ROM to RAM. effectively enhancing performance, and reducing the amount of upper memory available by 32KB (the C0000~C7FFF area of memory between 640 KB and 1 MB is used).

C8000-CBFFF Shadow
Enabling any of the C8000~CBFFF segments allows components to move their firmware into these upper memory segments. However your computer can lock-up doing so, because some devices don't like being shadowed at those particular 16 KB segments of upper memory.

Note - In Windows 95, double click 'Computer' within Device Manager and select 'Memory'. This will tell you what segments (if any) are being shadowed For DOS you can use MSD.EXE to see what segments are claimed.
CC000-CFFFF - D0000-D3FFF - D4000-D7FFF - D8000-DBFFF and DC000-DFFFF - Same as above.

Chipset Features Setup


CMOS Setup Utility - Copyright (C) 1984-2002 Award Software
Advanced Chipset Features
SDRAM CAS Latency Time [3]
SDRAM Cycle Time Tras/Trc [Auto]
SDRAM RAS-to-CAS Delay [Auto]
SDRAM RAS Precharge Time [Auto]
System BIOS Cacheable [Enabled]
Video BIOS Cacheable [Enabled]
Memory Hole At 15M-16M [Disabled]
CPU Latency Timer [Enabled]
Delayed Transaction [Enabled]
AGP Graphics Aperture Size [64MB]
Display Cache Frequency [100 MHz]
System Memory Frequency [100 MHz]
On-Chip Video Window Size [64MB]
* Onboard Display Cache Setting *
CAS# Latency [3]
Paging Mode Control [Open]
RAS-to-CAS Override [by CAS# LT]
RAS# Timing [Fast]
RAS# Precharge Timing [Fast]
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: Optimized Defaults

DRAM Settings
The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

SDRAM CAS Latency Time
When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.

SDRAM Cycle Time Tras/Trc
Select the number of SCLKs for an access cycle

SDRAM RAS-to-CAS Delay
This field let's you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

SDRAM RAS Precharge Time
If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. Fast gives faster performance; and Slow givesmore stable performance. This field applies only when synchronous DRAM is installed in the system.

P2C/C2P Concurrency
When Disabled, CPU bus will be occupied during the entire PCI operation period.

System BIOS Cacheable
Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable
Select Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Memory Hole At 15M-16M
You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirement.

CPU latency Timer
When enabled this item, the CPU cycle will only be deferred after it has been held in a "Snoop Stall" for 31 clocks and another ADS# has arrived. When disabled, the CPU cycle will be deferred immediatedly after the GMCH receives another ADS#.

Delayed Transaction
The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1

AGP Graphics Aperture Size
This fielf determines the effective size of the Graphic Aperture used for a particular GMCH configuration. It can be updated by the GMCH-specific BIOS configuration sequence before the PCI standard bus enumeration sequence takes place. If it is not updated then a default value will select an aperture of maximum size.

Display Cache Frequency
You can use this item to select the frequency of the display cache.

System Memory Frequency
You can use this item to select the operating frequency for the main system.

On-Chip Video Window Size
Select the on-chip video window size for VGA drives use.

Onboard Display Cache Setting
Setting the onboard display cache timing

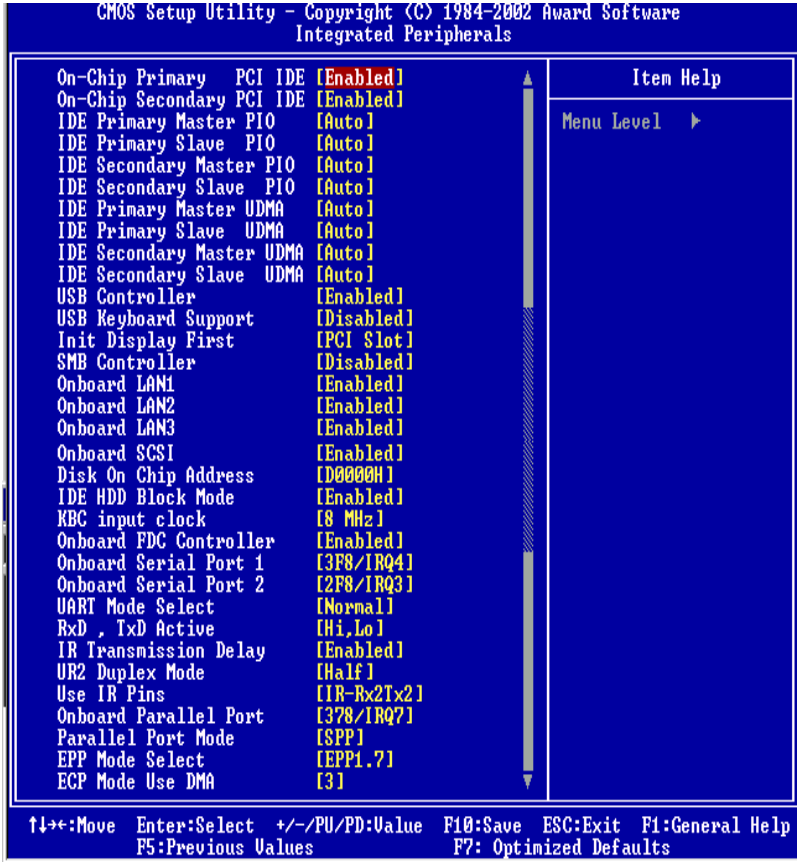
CAS#Latency
Select the local memory clock periods

Paging Mode Control
Select the paging mode control

RAS-to-CAS Override
Select the display cache clock periods control

RAS# Timing
This item controls RAS# active to Protegra, and refresh to RAS# active delay (in local memory clocks).

RAS# Precharge Timing
This item controls RAS# precharge (in local memory clocks).


CMOS Setup Utility - Copyright (C) 1984-2002 Award Software
Integrated Peripherals
On-Chip Primary PCI IDE [Enabled]
On-Chip Secondary PCI IDE [Enabled]
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Secondary Master PIO [Auto]
IDE Secondary Slave PIO [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
IDE Secondary Master UDMA [Auto]
IDE Secondary Slave UDMA [Auto]
USB Controller [Enabled]
USB Keyboard Support [Disabled]
Init Display First [PCI Slot]
SMB Controller [Disabled]
Onboard LAN1 [Enabled]
Onboard LAN2 [Enabled]
Onboard LAN3 [Enabled]
Onboard SCSI [Enabled]
Disk On Chip Address [D0000H]
IDE HDD Block Mode [Enabled]
KBC input clock [8 MHz]
Onboard FDC Controller [Enabled]
Onboard Serial Port 1 [3F8/IRQ4]
Onboard Serial Port 2 [2F8/IRQ3]
UART Mode Select [Normal]
RxD , TxD Active [Hi,Lo]
IR Transmission Delay [Enabled]
UR2 Duplex Mode [Half]
Use IR Pins [IR-Rx2Tx2]
Onboard Parallel Port [378/IRQ7]
Parallel Port Mode [SPP]
EPP Mode Select [EPP1.7]
ECP Mode Use DMA [3]
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: Optimized Defaults

↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

OnChip Primary/Secondary PCI IDE
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.

Primary & Secondary Master/Slave PIO
These four PIO fields let you set a PIO mode (0-4) for each of four IDE devices. When under "Auto" mode, the system automatically set the best mode for each device

Primary & Secondary Master/Slave UDMA
When set to "Auto" mode, the system will detect if the hard drive supports

Ultra DMA mode.

USB Controller
Select "Enable" if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

USB Keyboard Support
Select "Enable" if your system contains a Universal Serial Bus (USB) controller and you have USB keyboard.

Init Display First
This item allows you to decide to active whether PCI slot or on-chip VGA first

SMB Controller
Select "Disable" for System Management Controller to free more IRQ address to be used.

Onboard LAN1
Select "Enable" if your system contains a LAN1 port.

Onboard LAN2
Select "Enable" if your system contains a LAN2 port.

Onboard LAN3
Select "Enable" if your system contains a LAN3 port.

Onboard SCSI
Select "Enable" if your system contains a Small Computer System Intergrated (SCSI) and you have SCSI device

Disk On Chip Address
Show the memory address for DiskOnChip device

IDE HDD Block Mode
This feature enhances disk performance by allowing multi-sector data transfers and eliminates the interrupt handling time for each sector.

Onboard FDC Controller
Select "Enabled" to activate the on-board FDD
Select "Disabled" to activate an add-on FDD

Onboard Serial Port 1 & 2
Select an address and corresponding interrupt for the first/second serial port. The default value for the first serial port is "3F8/IRQ4" and the second serial port is "2F8/IRQ3".

UART Mode Select
This item allows you to select UART mode. The choices: IrDA, ASKIR, Normal.

RxD, TxD Active
This item allows you to determine the active of RxD, TxD. The choices: "Hi,Hi", "Lo,Lo", "Lo,Hi", "Hi,Lo".

IR Transmission Delay
This item allows you to enable/disable IR transmission delay. The Choices:Enable, Disabled.

UR2 Duplex Mode
This item allows you to select the IR half/full duplex function.

Use IR Pins
This item allows you to select IR transmission routes, IR-Rx2Tx2, RxD2 and TxD2.

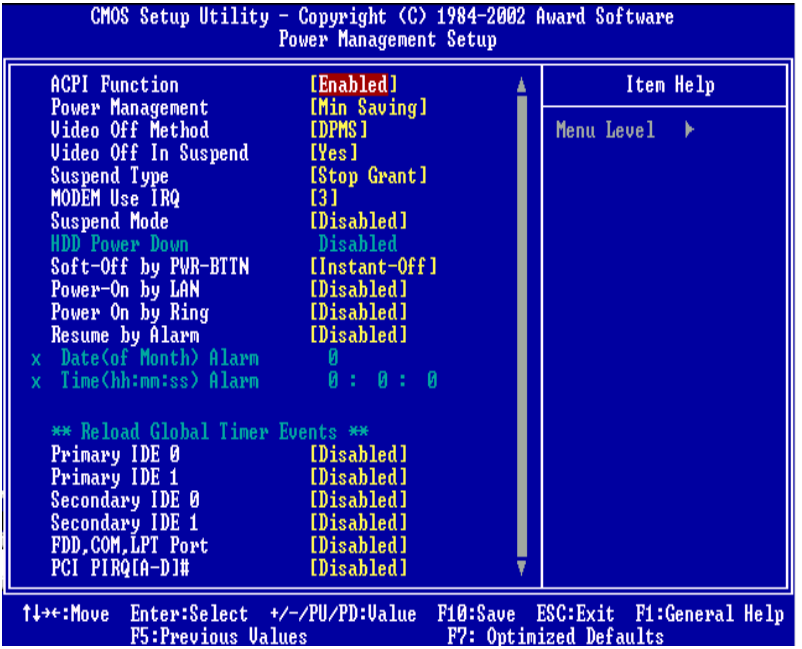
Onboard Parallel Mode
Select an operating mode for the parallel port. Mode options are 3BC/IRQ7, 378/IRQ7, 278/IRQ5, and Disable.

Parallel Port EPP Type
Select a EPP Type if parallel Port is set as SPP,EPP, ECP,and ECP+EPP.

EPP Mode Select
Select a EPP Mode Type: EPP1.7 or EPP1.9.

ECP Mode Use DMA
Select a DMA channel if parallel Mode for using ECP mode: 3 or 1.

Power Management Setup


CMOS Setup Utility - Copyright (C) 1984-2002 Award Software
Power Management Setup
ACPI Function [Enabled]
Power Management [Min Saving]
Video Off Method [DPMS]
Video Off In Suspend [Yes]
Suspend Type [Stop Grant]
MODEM Use IRQ [3]
Suspend Mode [Disabled]
HDD Power Down Disabled
Soft-Off by PWR-BTTN [Instant-Off]
Power-On by LAN [Disabled]
Power On by Ring [Disabled]
Resume by Alarm [Disabled]
x Date(of Month) Alarm 0
x Time(hh:mm:ss) Alarm 0 : 0 : 0
** Reload Global Timer Events **
Primary IDE 0 [Disabled]
Primary IDE 1 [Disabled]
Secondary IDE 0 [Disabled]
Secondary IDE 1 [Disabled]
FDD,COM,LPT Port [Disabled]
PCI PIRQ[A-D]# [Disabled]
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: Optimized Defaults

ACPI Function
Select Enabled only if your computer's operating system supports ACPI (the Advanced Configuration and Power Interface) specification. Currently, Windows 98 and Windows2000 support ACPI.

Power Management
There are 4 selections for Power Management, 3 of which have fixed mode :

Disabled (default)	No power management. Disables all four modes.
Min. Power Saving	Minimum power management. Doze Mode = 1 hr., Standby Mode = 1 hr., Suspend Mode = 1 hr.,
Max. Power Saving	Maximum power management -- ONLY AVAILABLE FOR SL CPU's.. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr.

Video Off Method
This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	cause the system to turn off the vertical and horizontal synchronization signals and writes blanks to the screen.
Blank Screen	This option only writes blanks to the screen.
DPMS	Initial display power management signaling.HDD Power Down is always set independently

Video Off In Suspend

Controls what causes the display to be switched off
Suspend -> Off Always On All Mode -> Off

Suspend Type
S1 (POS) Power On suspend
All devices are powered up except for the clock synthesizer. The Host and PCI clocks are inactive and PIIX4 provides control signals and 32-kHz Suspend Clock (SUSCLK) to allow for DRAM refresh and to turn off the clock synthesizer. The only power consumed in the system is due to DRAM Refresh and leakage current of the powered devices. When the system resumes from POS, PIIX4 can optionally resume without resetting the system, can reset the processor only, or can reset the entire system. When no reset is performed, PIIX4 only needs to wait for the clock synthesizer and processor PLLs to lock before the system is resumed. This takes typically 20 ms.

S3 (STR) Suspend To RAM
Power is removed from most of the system components during STR, except the DRAM. Power is supplied to Suspend Refresh logic in the Host Controller, and RTC and Suspend Well logic in PIIX4. PIIX4 provides control signals and 32-kHz Suspend Clock (SUSCLK) to allow for DRAM refresh and to turn off the clock synthesizer and other power planes.

Modem Use IRQ
Name the interrupt request (IRQ) assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

Suspend Mode
When the suspend mode has been enabled after the selected period of system inactivity, all devices except CPU will be shut down.

HDD Power Down
When enabled, an Advanced power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If the Max. Power Saving is not enabled, this will be preset to No.

Soft-Off By PWRBTN
The field defines the power-off mode when using an ATX power supply. The Instant-Off mode means powering off immediately when pressing the power button. In the Delay 4 Sec mode, the system powers off when the power button is pressed for more than four seconds or places the system in a very low-power-usage state, with only enough circuitry receiving power to detect power button activity or resume by ring activity when press for less than four seconds. The default is 'Instant-Off'.

Power-On by LAN
An input signal on the LAN, which awakens the system from a soft off state.

Power-On by Ring
An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

Resume by Alarm

Wake Up Events

Setting an event on each device listed to awaken the system from a soft off state.

VGA

LPT & COM

HDD & FDD

PCI Master

Power On by PCI Card

Wake Up on LAN/Ring

RTC Alarm Resume

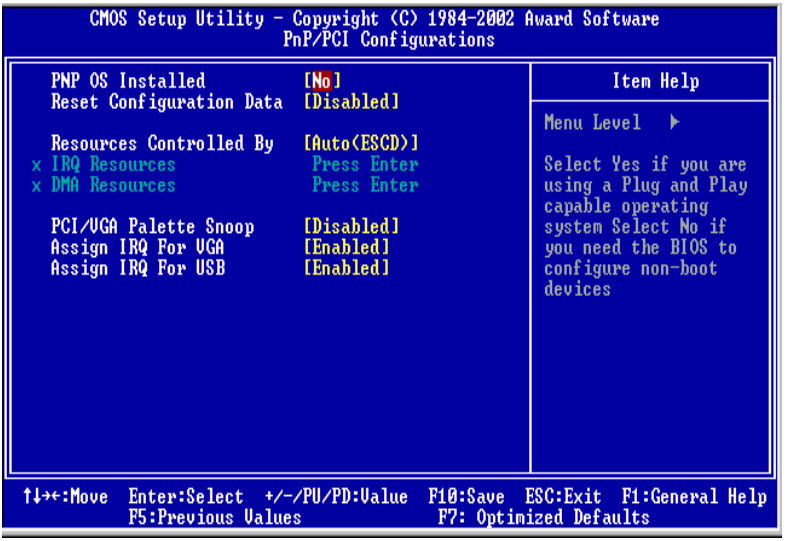
Date (of Month)

Resume Time (hh:mm:ss)

Primary INTR

IRQs Activity Monitoring

PnP/PCI Configuration


CMOS Setup Utility - Copyright (C) 1984-2002 Award Software
PnP/PCI Configurations
PNP OS Installed [No]
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
x DMA Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
Assign IRQ For VGA [Enabled]
Assign IRQ For USB [Enabled]
Item Help
Menu Level ▶
Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: Optimized Defaults

↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-SAfe Defaults F7:Optimized Defaults

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

PnP OS Installed
Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95).

Reset Configuration Data
Normally, you leave this field Disabled. Select Enabled to reset ESCD (Extended System Configuration Date) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

Resource Controlled By
The Award Play and Play BIOS can automatically configure all the boot and Plug-and-Play compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

IRQ Resources
When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt :

Legacy ISA Devices compliant with the original PC/AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).

PCI/ISA PnP Device compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

DMA Resources
When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the DMA :

Legacy ISA Devices compliant with the original PC/AT bus specification, requiring a specific DMA channel.

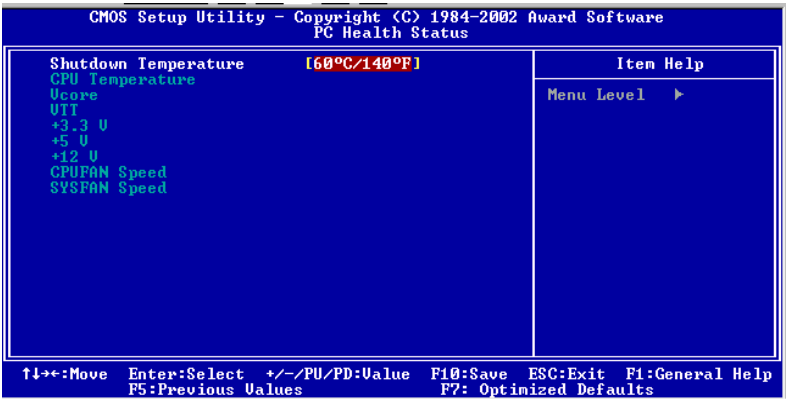
PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

PCI/VGA Palette Snoop
Normally this option is always Disabled! Nonstandard VGA display adapters such as overlay cards or MPEG video cards may not show colors properly. Setting Enabled should correct this problem. If this field set Enabled, any I/O access on the ISA bus to the VGA card's palette registers will be reflected on the PCI bus. This will allow overlay cards to adapt to the changing palette colors.

Assign IRQ For VGA
Many high-end graphics accelerator cards now require an IRQ to function properly. Disabling this feature with such cards will cause improper operation and/or poor performance. Thus, it's best to make sure you enable this feature if you are having problems with your graphics accelerator card. However, some low-end cards don't need an IRQ to run normally. Check your graphics card's documentation (manual). If it states that the card does not require an IRQ, then you can disable this feature to release an IRQ for other uses. When in doubt, it's best to leave it enabled unless you really need the IRQ.

Assign IRQ For USB
Windows 95 will automatically give an IRQ to the USB port even if there is no USB peripheral connected. Disabling this will free the IRQ.

PC Health Status



This section describes CPU tempeare for the system.

Shutdown Temperature
This item allows you to set up the CPU shutdowm Temperature. This item only effective under Windows 98 ACPI mode.

CPU Temperature
Show you the current system temperature

Vcore
One type of CPU voltage

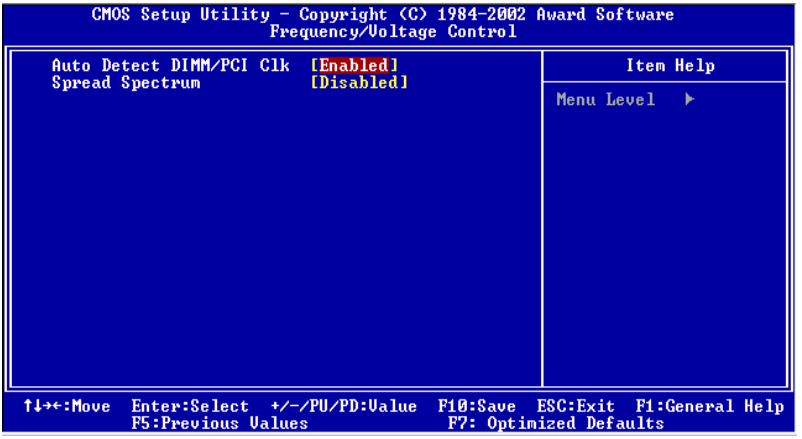
UTT
One type of CPU voltage

+3.3V, +5V, +12V
Show you the voltage of +3.3V, +5V, +12V

CPUFAN Speed
Show you the current CPUFAN operating speed

SYSFAN Speed
Show you the current SystemFAN operating speed

Frequency/Voltage Control


CMOS Setup Utility - Copyright (C) 1984-2002 Award Software
Frequency/Voltage Control
Auto Detect DIMM/PCI Clk [Enabled]
Spread Spectrum [Disabled]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7: Optimized Defaults

This section describes Frequency and Voltage control for the system.

Auto Detect DIMM/PCI CLK
When enabled, this item will auto detect if the DIMM and PCI socket have devices and will send clock signal to DIMM and PCI devices. When disabled, it will send the clock signal to all DIMM and PCI socket.

Spread Spectrum
This item allows you to enable/disable the spread spectrum modulate.

POST Codes

The following codes are not displayed on the screen. They can only be viewed on the LED display of a so called POST card. The codes are listened in the same order as the according functions are executed at PC startup. If you have access to a POST Card reader, you can watch the system perform each test by the value that's displayed. If the system hangs (if there's a problem) the last value displayed will give you a good idea where and what went wrong, or what's bad on the system board.

CODE	DESCRIPTION OF CHECK
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved

0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial onboard clock generator if Early_Init_Onboard_Generator is defined. See also POST 26h.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead.
24h	Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information.

25h	Early PCI Initialization: -Enumerate PCI bus number. -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0
26h	1. If Early_Init_Onboard_Generator is not defined Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 2. Init onboard PWM 3. Init onboard H/W monitor devices
27h	Initialize INT 09 buffer
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed.
2Ah	Reserved
2Bh	Invoke Video BIOS
2Ch	Reserved
2Dh	1. Initialize double-byte language font (Optional) 2. Put information on screen display, including Award title, CPU type, CPU speed, full screen logo.
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard if Early_Reset_KB is defined e.g. Winbond 977 series Super I/O chips. See also POST 63h.
34h	Reserved
35h	Test DMA Channel 0
36h	Reserved
37h	Test DMA Channel 1.
38h	Reserved
39h	Test DMA page registers.
3Ah	Reserved
3Bh	Reserved

3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program write allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB Keyboard & Mouse.
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Clear password according to H/W jumper (Optional)
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved

57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO 2. Initialize Init_Onbaord_AUDIO.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reset keyboard if Early_Reset_KB is not defined.
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved

71h	Reserved
72h	Reserved
73h	(Reserved
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	(Optional Feature) Enter AWDFLASH.EXE if: -AWDFLASH.EXE is found in floppy drive. -ALT+F2 is pressed.
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Init HDD write protect.
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported. - If errors occur, report errors & wait for keys - If no errors occur or F1 key is pressed to continue : wClear EPA or customization logo.
80h	Reserved
81h	Reserved

E8POST.ASM starts

82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. Switch screen back to text mode
86h	Reserved
87h	NET PC: Build SYSID Structure.
88h	Reserved

89h	1. Assign IRQs to PCI devices 2. Set up ACPI table at top of the memory.
8Ah	Reserved
8Bh	1. Invoke all ISA adapter ROMs 2. Invoke all PCI ROMs (except VGA)
8Ch	Reserved
8Dh	1. Enable/Disable Parity Check according to CMOS setup 2. APM Initialization
8Eh	Reserved
8Fh	Clear noise of IRQs
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program Daylight Saving 3. Program boot up speed 4. Chipset final initialization. 5. Power management final initialization 6. Clear screen & display summary table 7. Program K6 write allocation 8. Program P6 class write combining
95h	Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

Howto : Flash the BIOS

To flash your BIOS you'll need

1) a xxxxx.bin file that is a file image of the new BIOS

2) AWDFLASH.EXE a utility that can write the data-file into the BIOS chip.

Create a new, clean DOS 6 bootable floppy with "format a: /s".

Copy flash utility and the BIOS image file to this disk.

Turn your computer off. Insert the floppy you just created and boot the computer. As it boots up, hit the [DEL] key to enter the CMOS setup. Go to "LOAD SETUP (or BIOS) DEFAULTS," and then save and exit the setup program. Continue to boot with the floppy disk.

Type "AWDFLASH" to execute the flash utility. When prompted, enter the name of the new BIOS image and begin the flash procedure. Note: If you reboot now, you may not be able to boot again.

After the flash utility is complete, reboot the system.

What to do when the Award flasher says: Insufficient memory

1. In CMOS Chipset Features Setup, Disable Video Bios Cacheable.

2. Hit Esc, F10, Save and exit.

3. Flash the BIOS and reboot

4. Enter CMOS Chipset Features Setup,and Enable Video Bios Cacheable, hit Esc, F10, Save and reboot.

What if things go wrong

if you use the wrong Flash BIOS or if the writing process gets interrupted, there is a fat chance that your computer won't boot anymore.

How can you recover a corrupt BIOS ?

Boot-block booting (this works only for Award BIOS)

Modern motherboards based on Award BIOS have a boot-block BIOS. This is small area of the BIOS that doesn't get overwritten when you flash a BIOS. The boot-block BIOS only has support for the floppy drive. If you have the AGP video enabled you won't see anything on the screen because the boot-block BIOS only supports an ISA videocard.

If you do not want to change your AGP video setting than proceed as follows:

The boot-block BIOS will execute an AUTOEXEC.BAT file on a bootable diskette. Copy an Award flasher & the correct BIOS *.bin file on the floppy and execute it automatically by putting awdflash *.bin in the AUTOEXEC.BAT file.

Solution 2: Hot-swapping

1. Replace the corrupt chip by a working one. The working BIOS doesn't have to be written for your board, it just has to give you a chance of booting to DOS.

BIOSs for the same chipset mostly work. (Chipsets that not differ too much also mostly work. (e.g. Triton FX chipset and Triton HX chipset)

2. Boot the system to DOS (with floppy or HD)

3. Be sure that the System BIOS cacheable option in your BIOS is enabled! If so replace (while the computer is powered on) the BIOS chip with the corrupt one. This should work fine with most boards because the BIOS is shadowed in RAM.

4. Flash an appropriate BIOS to the corrupt chip and reboot.

NOTE: Use a flasher from MRBIOS (**http://www.mrbios.com**). Utilities that come with your motherboard often use specific BIOS-hooks. Because you have booted with a BIOS not written for your motherboard they usually don't work. The MR Flash utilities communicate directly with your Flash Rom and always work. In most cases they flash a non-MRBIOS to your BIOS chip without problems.

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.